



# Mechanical Image Duplicator

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## TOOLS:

- [Marking pen \(1\)](#)
- [Scissors \(1\)](#)

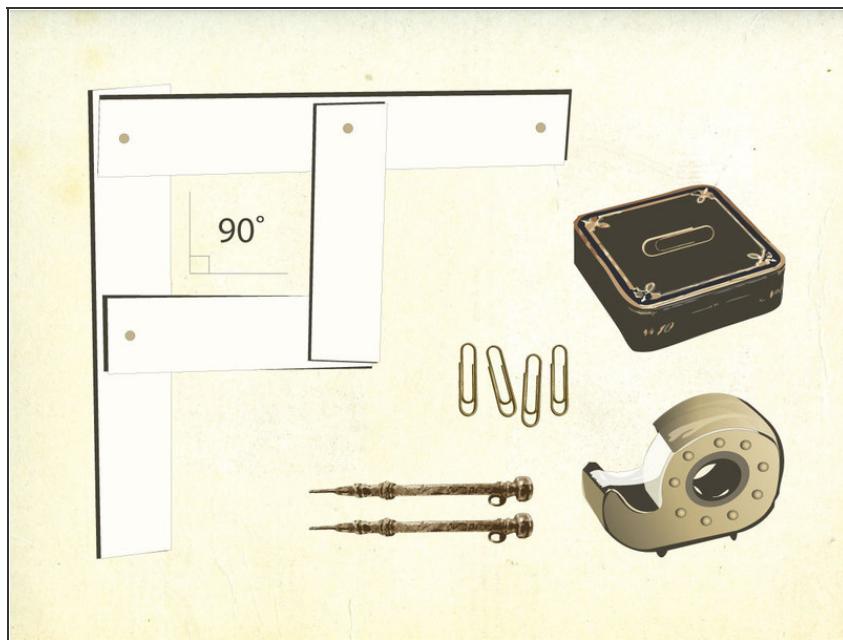
## PARTS:

- [Cardboard \(1\)](#)
- [Pencils \(2\)](#)
- [Paper \(1\)](#)
- [Paper clips \(4\)](#)
- [Paper clip boxes \(2\)](#)
- [Battery \(1\)](#)  
*or other small weight*
- [Tape \(1\)](#)

## SUMMARY

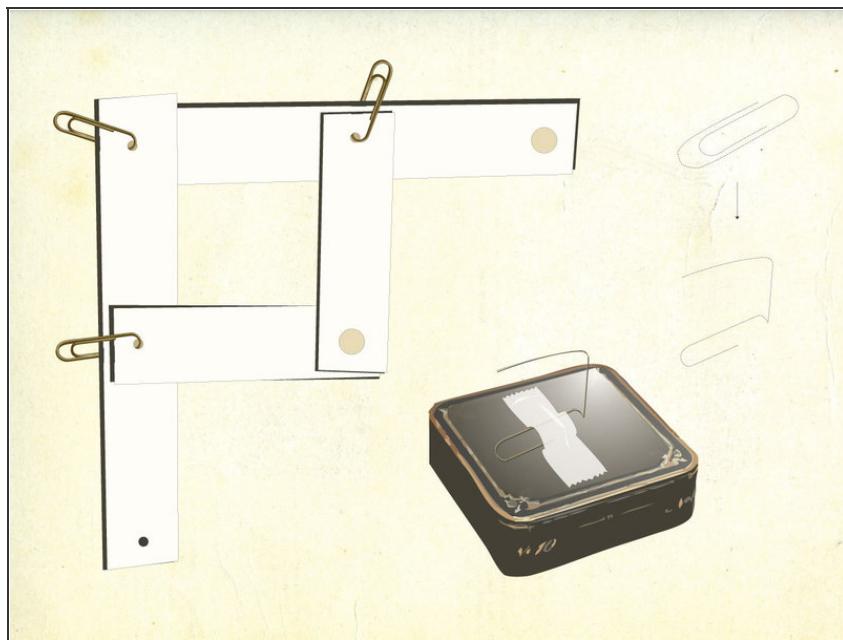
Before Chester Carlson invented photocopying, inventors engineered various mechanical devices to replicate images. With a few everyday items found in the home, you can make a pantograph, an image duplicator that allows you to use one pencil to trace an image while another pencil follows its path in parallel to produce a near-identical copy.

## Step 1 — Cut out and position cardboard strips.



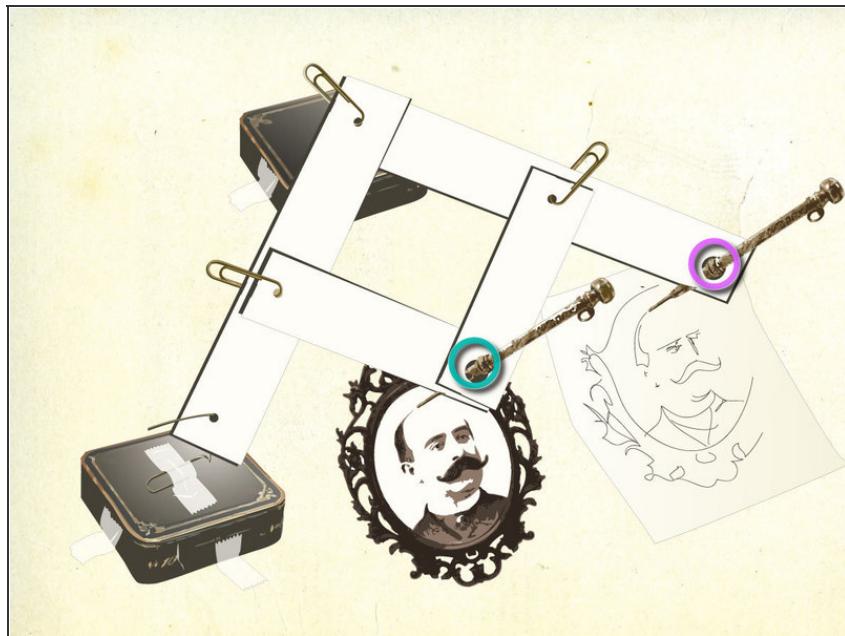
- You'll need 4 cardboard strips. Cut 2 strips measuring 2"×4" and another pair 2"×8", as shown in the picture.
- Place the 2 pairs of strips at right angles to each other, with the smaller pair lying on top of the larger pair.

## Step 2 — Link cardboard strips with paper clips.



- Cut 4 holes in the strips and slip 3 paper clips into them, as shown in the picture.
- Bend up the end of another paper clip, as shown, and tape it to the top of a paper clip box.

### Step 3 — Add pencils and secure to table.



- Cut 2 holes in the image duplicator strips large enough for 2 pencils to fit snugly and stand erect, as shown in the picture. Turn the cardboard strips over and slip the hole at the end of the left-hand strip over the paper clip that's taped to the top of the paper clip box.
- Place a second paper clip box under the image duplicator where the 2 large strips meet, to keep it level.
- To ensure that the drawing pencil (pink) presses against the paper properly, you can add weight to the cardboard strip by taping a AA battery underneath it.
- Place the original image under pencil A (blue), and a blank sheet of paper under pencil B (pink). Trace the original design with pencil A. Pencil B will follow along, drawing the image on the paper.
- Experiment with different lengths of strips to make larger and smaller copies of the original design.

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